WHAT IS CLAIMED IS:

1. A micro-cantilever device comprising:
a base section;
a cantilever section having a length and a tapered width along the length, the cantilever section connected to the base section, the tapered width a function of position along the length.

2. The micro-cantilever device of claim 1 wherein the function is defined by tapered width = $w_0 + ax$.

3. The micro-cantilever device of claim 1 wherein the function is defined by tapered width = $w_0 + ax^2$.

4. The micro-cantilever device of claim 1 wherein the function is defined by tapered width = $w_0 + ax^3$.

5. The micro-cantilever device of claim 1 wherein the function is defined by tapered width = $w_0 + \exp(ax)$.

6. The micro-cantilever device of claim 1 wherein the function is defined by tapered width = $w_0 + ax + bx^2$.

6. The micro-cantilever device of claim 1 wherein the function is defined by tapered width = $w_0 + ax + bx^2 + cx^3$

7. The micro-cantilever device of claim 1 further comprising a ground plane below a portion of the cantilever section.

8. The micro-cantilever device of claim 1 wherein the micro-cantilever has a pull-in voltage that is calculated as function of dimensions of the cantilever section and material properties of the cantilever section.

9. The micro-cantilever device of claim 8 wherein the function is substantially defined by $V_{PI} = 1.5X10^{-12} a^{-0.2009} L^{-2.1899} w_0^{0.2166} \sqrt{E}$.

10. The micro-cantilever device of claim 8 wherein the function is substantially defined by $V_{PI} = 3.2626X10^{-13} a^{(-0.3385+76.4667L)} L^{-2.8044} w_0^{0.3219} \sqrt{E}$.

11. The micro-cantilever device of claim 8 wherein the function is substantially defined by $V_{PI} = 1.0021x10^{-11} \sqrt{E} L^{-1.7868} \exp[a(1.01469x10^{-5} - 0.4221L)]$.

12. The micro-cantilever device of claim 8 wherein the function is derived by performing the steps of:

determining a geometry of the micro-cantilever device;

determining a plurality of pull-in voltages for at least one length of the micro-cantilever device; and

fitting a pull-in voltage formula to the plurality of pull-in voltages based upon the geometry of the micro-cantilever device.

13. The micro-cantilever device of claim 12 further comprising the step of assuming a form of the pull-in voltage formula.

14. The micro-cantilever device of claim 13 wherein the form of the pull-in voltage is $V_{PI} = ka^x w_0^y L^z$ if the micro-cantilever device has one of a linear tapered width and a parabolic tapered width.

15. The micro-cantilever device of claim 13 wherein the form of the pull-in voltage is $V_{PI} = ke^{ax} L^y$ if the micro-cantilever device has an exponential tapered width.

16. The micro-cantilever device of claim 1 wherein the cantilever section has at least one open window.

17. The micro-cantilever device of claim 16 wherein the micro-cantilever device has an axis about which the micro-cantilever device is symmetrical and wherein the at least one open window is located on the axis.

18. The micro-cantilever device of claim 1 further comprising a second base section and wherein the cantilever section is attached to the second base section.

19. The micro-cantilever device of claim 18 further comprising a ground plane located below the cantilever section.

20. The micro-cantilever device of claim 18 wherein the cantilever section has at least one open window.

21. The micro-cantilever device of claim 18 further comprising a strain relief at at least one of the base section and second base section.

22. The micro-cantilever device of claim 18 wherein the cantilever section includes a lateral stress relief.

23. The micro-cantilever device of claim 1 wherein the micro-cantilever device is manufactured using a Multi-User Micro-Electro-Mechanical Systems Process.

24. The micro-cantilever device of claim 1 wherein the tapered width is a function of position along the length and one of a sinusoidal function, a stepped function, and a trapezoidal function.

25. A method to determine a pull-in voltage formula comprising the steps of:

determining a geometry of the micro-cantilever device;

determining a plurality of pull-in voltages for a plurality of lengths of the micro-cantilever device; and

fitting a pull-in voltage formula to the plurality of pull-in voltages based upon the geometry of the micro-cantilever device.

26. The micro-cantilever device of claim 25 further comprising the step of assuming a form of the pull-in voltage formula.

27. The micro-cantilever device of claim 26 wherein the form of the pull-in voltage is $V_{PI} = ka^x w_0^y L^z$ if the micro-cantilever device has one of a linear tapered width and a parabolic tapered width.

28. The micro-cantilever device of claim 26 wherein the form of the pull-in voltage is $V_{PI} = ke^{\alpha x} L^y$ if the micro-cantilever device has an exponential tapered width.

29. The method of claim 25 wherein the step of determining a plurality of pull-in voltages for a plurality of lengths of the micro-cantilever device comprises the steps of:

a) iteratively solving a displacement vector as a function of applied voltage across the micro-cantilever device;

b) determining a voltage at which a solution of the displacement vector does not converge;

c) setting a pull-in voltage to the voltage at which the solution did not converge; and

d) repeating steps a-c for a number of slope constants.

30. The method of claim 29 further comprising the step of repeating steps a-d for each length.